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Password: “Rubber shoe”

Wet press for draining fiber webs the invention relates to a wet press for draining a fiber web, which goes through a press nip, which is on the one hand formed of a rotating roll and on the other hand of an endless liquid impermeable belt together with a felt course to the uptake of liquid, which is kept by means of a slide shoe against the roller, whereby roller and slide shoe are to each other more movable relative to the generation of the press pressure, and with a lubricant supply before the approach edge of the slide shoe.

As well known will such apparatuses to the formation of an extended nip applied, in order to increase the dewatering, compared to similar press rolls, substantial. With graphic papers e.g. the dry content of the web from 40 to 45 can become in this way ffi atro on 55 to 60% atro increased. With hygienic papers it is significant that very positive affected apart from the increase of the dry content the product can become concerning required softness by an extended nip. To the achievement of an extended nip with higher pressure it is in the building of paper-making machines known, a circumferential belt by means of a press shoe hydrostatic against a circumferential roller to press in particular (US-PS 3,853,698).

During this known mechanism it is very difficult to seal against lateral oil leakage. Even with expensive seals such a construction is not to be gotten complete dense. For the operation is this very detrimental. Belt can set dirt in the free part. It is therefore required that it becomes scraped before the inlet. Particularly problematic is it, if the pressing members of the web lifted to become to be supposed.

This cannot happen, without sucking the Ö1 off before.

It is furthermore such a mechanism known with which within the circumferential belt slide shoes are also to the roll surface curved bottom hydraulic pressure standing slide shoes disposed, before whose approach edge a lubricant supply disposed is. Here an hydrodynamic lubricating film forms out (DE-AS 23 26 980).

With such a formation shown itself again and again undesirable strips on the paper web and damages at the circumferential belt. The inventors recognized that the reason lies for this in the fact that with small-area thick fluctuations of the web, in particular with thick webs, it comes to local pressure points and thus to breaking the hydrodynamic lubricating film. The damages result from the Trockenreibung arising with it. Also it is difficult with this formation to maintain a certain pressure distribution profile if itself e.g.

in lapses of time the felt compressibility changed.

The invention is the basis the object to create a wet press of the genus initially specified which insensitive against thick fluctuations or against local strong unevenness e.g. by lumps od.dgl. and which is a very uniform lubricating film formation and thus a larger working reliability ensured.

The invention solves the problem with such a wet press by the fact that the slide shoe consists of a compressible resilient deformable material concave by the Walzendruck and central or immediate by a unverdrehbar stored yoke within the belt kept is. The slide shoe preferably consists of rubber and is on a metal foot kept.

Such a slide shoe adapts to the backing roll to a large extent.

Its surface does not have to become absolute accurate the corresponding rolling curvature concave worked. Between the slide shoe and the circumferential belt a lubricating film is formed in accordance with the elastohydrodynamischen lubricating film theory. Afterwards large local unevenness causes only small pressure changes and thus also only small changes of lubricating film thickness. Thick fluctuations in the wet web as well as eventual lump od.dgl. do not lead to local pressure points with Trockenreibung, but the shoe adapts at these locations, the unevenness to these circumstances light is caught. The local pressure changes affect the neighbour ranges - contrary to a rigid shoe - only insignificantly. Due to the very uniform lubricating film formation the coefficient of friction between shoe and belt becomes smaller as with the known such apparatuses.

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By the design of the form and the support of the slide shoe a certain pressure distribution profile can become fixed and also obtained if itself for example in lapses of time the felt compressibility changed. If the backing roll must be reground, it is not necessary to replace or work on the slide shoe corresponding, since it adapts automatically to the other curvature. To the increase of the elasticity of the slide shoe it points to that in favourable other formation Invention at its contact surface with the metal foot groove-like grooves up, by which cooling liquid passed can become if necessary.

Preferably fluidbeauf schlagbares a pressure cushion is disposed between metal foot and yoke. Thereby it is possible to vary the contact pressure of the slide shoe at the roller. Preferably is so disposed thereby the pressure cushion that the resultant force applied on the slide shoe of the pressure cushion goes through into running direction of the rolling extent latter half of the formed PreBspaltes. Thereby a slow pressure increase becomes effected, which drops then at the end of the nip rapid.

In order to know over the rolling-wide different contact pressures e nstellen, the pressure cushion is axial in zones divided.

The change of the elasticity of the slide shoe can become this also in advantageous manner as pressure-subjectable hollow bodies formed. The possibility exists to divide this hollow body into chambers which are subjectable with different pressure. It is possible to obtain zones different elasticities.

In accordance with a favourable other formation of the invention circumferential belt is through at its front sides fixed annular discs in an essentially walzenförmigen form kept.

Due to this formation additional deflection rollers for belt, the lubricant are unnecessary can in this so formed to a large extent closed body light again caught and cooled reused become. In order to make possible with this form of the belt formed as roll mantel the required radial deformation in the press nip, that gets over belt at each front side over the rolling-prolonged around a certain measure.

The invention is in the following in an embodiment more near explained on the basis the drawing.

In it shows:
Fig. 1 flüssigkeitsundurch leave belt mig formed in the section the principle of a wet press after the invention with one walzenför;
Fig. 2 in the longitudinal cross section press end also over the roller supernatant belt;
Fig. 3 the principle sketch of one looks for wet press also on opposite sides of one
Roller disposed slide shoes, and
Fig. 4 in the section the alternative training one
Slide shoe after the invention.

Between roller 5, which is in direction of arrow 6 rotated, and an impermeable rubber band 7, against which from innnen a slide shoe puts on itself 8 from rubber, due to the compliance and deformation of the slide shoe 8 an extended press nip S formed, which the paper web 9 and felt 10 travel through and become dewatered. The slide shoe 8 is on a metal foot 11 fixed. In the slide shoe 8 groove-like grooves are 12 provided on that the metal foot of facing side. The metal foot 11 is over a pressure cushion 13 from a resilient material, e.g. Plastic or rubber, with a fixed yoke 14 connected and opposite this and crosswise for this positive kept guided by pins 15 in pressure direction.

For fastening the pressure cushion metalists 16 serve 13 at the metal foot 11 and at the yoke 14. The space 17 included of the pressure cushion is over the lines 18 in the yoke 14 pressure subjectable.

The pressure cushion 15 is in such a manner disposed that the resultant one of the pressure by the latter half of the press nip S, from which intake side goes ago to calculated, applied on the slide shoe 8. At the inlet of the press nip a spray pipe is 19 provided, by means of which Schmierflüssigkeit, e.g. Water or oil, into the intake gap between the belt 7 and the slide shoe sprayed becomes, whereby between both a lubricating film develops itself elasto hydrodynamic law in accordance with that.

For the radial movement delimitation of the metal foot away of the yoke, for the case, if the pressure roll becomes lifted and the pressure cushion still bottom overpressure stands, 11 hook shaped stops are 20 screwed, those in corresponding recesses 21 at the yoke 14 engage at the metal foot. As from Fig. 2 to recognize, that gets over belt 7 at the front sides over roller 5 and slide shoe 8 and is by annular discs 22, which exhibit a flange 25, at which the front end of the tape screwed is, in an essentially walzenförmigen form kept. The projection of the belt 7 over the slide shoe 8 at the front sides is necessary, in order to make the deformation possible in the range of the press nip.

In the embodiment after Fig. 3 is to both sides of the roller 5 a slide shoe 8 disposed. Due to this formation the roller is stressed by the slide shoe not on bend and can a corresponding smaller diameter obtained. Impermeable belt 7 ' is here not walzenförmig kept, but in actual known way 24 guided by means of additional rollers. Paper web 9 and felt 10 are here guided around the roller 5 around by the two formed press nips. The opposite yokes are 27 connected by armatures.

In the embodiment after Fig. 4 is the slide shoe as inflatable hollow bodies formed. For this an hose serves 25, which rests upon the foot 8. Between this hose 25 and the circumferential belt 7 a resilient belt is 26 disposed, which is at the accumulating side of the belt 7 at the metal foot 11 fixed. The hose 25 can be transverse to the course direction of travel in chambers divided, which are pressure subjectable different. Also subdivisions can be provided in course direction of travel, whereby one behind the other disposed into this cases become appropriately several hoses.

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